Drainage and Wastewater Management Plan

Brighton Peacehaven Wastewater System Plan

from Southern Water

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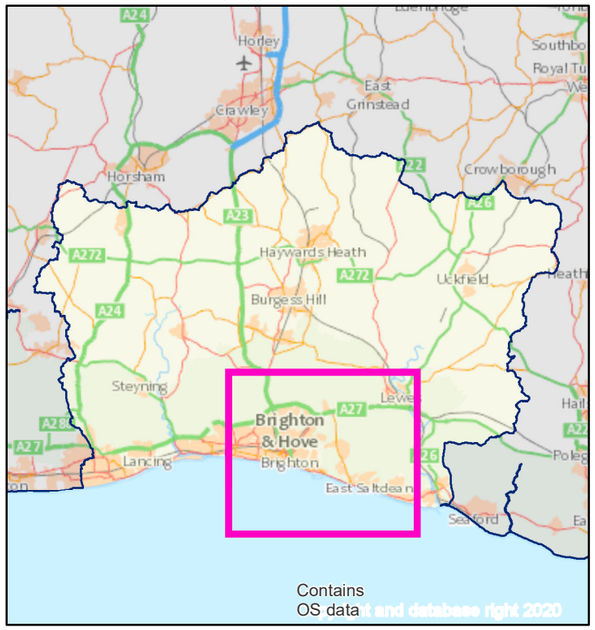
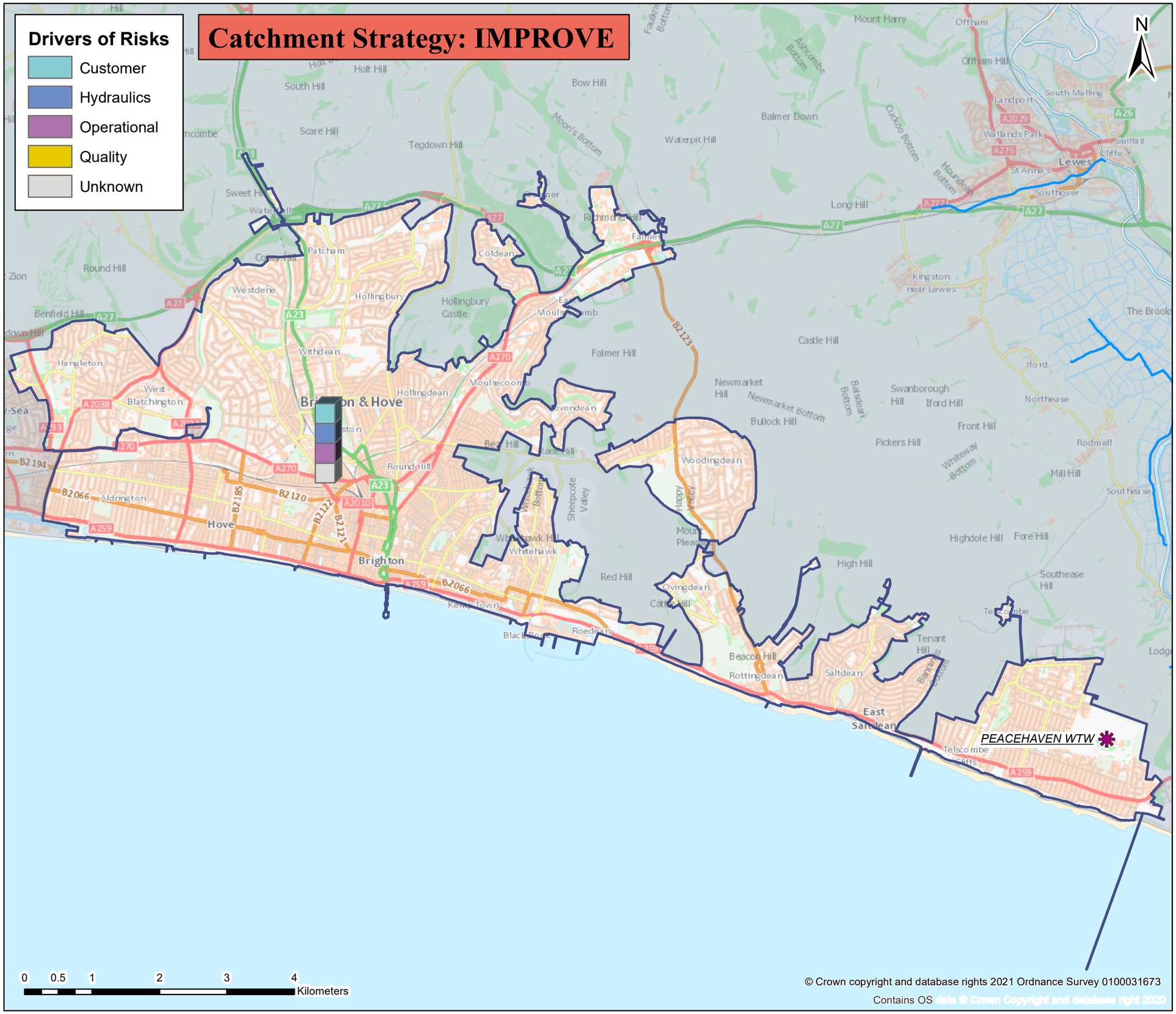


Population Equivalent (PE)	297,284
Discharge Waterbody	Long sea outfall into English Channel
Number of Pumping Stations	51
Number of Overflows	6
Length of Sewer (km)	1406.0
Catchment Reference	BRIG

BRAVA Results Table (BRIG)			
	Planning Objective	2020	2050
1	Internal Sewer Flooding Risk	1	
2	Pollution Risk	0	
3	Sewer Collapse Risk	0	
4	Risk of Sewer Flooding in a 1 in 50 year storm	2	2
5	Storm Overflow performance	2	2
6	Risk of WTW Compliance Failure	0	0
7	Risk of flooding due to Hydraulic Overload	1	2
8	Dry Weather Flow Compliance	0	0
9	Good Ecological Status / Potential	0	
10	Surface Water Management	2	
11	Nutrient Neutrality	NA	NA
12	Groundwater Pollution	2	
13	Bathing Waters	1	
14	Shellfish Waters	NA	



Problem Characterisation

Peacehaven Brighton (BRIG)

This document describes the causes of the risks identified by the Baseline Risk and Vulnerability Assessment (BRAVA). The BRAVA results for this wastewater system are summarised in Table 1. The results indicate that flooding, pollution and water quality are the main concerns in this wastewater system. We have completed risk assessments for 2050 where we have the data and tools available to do so. For the other planning objectives, we will explore how we can predict future risks for the next cycle of DWMPs. All the risk assessment methods need to be reviewed after the first DWMPs have been produced with a view to improve the methods and data for future planning cycles.

Table 1: Results of the BRAVA for Peacehaven Brighton wastewater system

Planning Objectives		2020	Driver	2050
1	Internal Sewer Flooding Risk	1	Customer	
2	Pollution Risk	0	-	
3	Sewer Collapse Risk	0	-	
4	Sewer Flooding in a 1 in 50-year storm	2	Hydraulic	2
5	Storm Overflow Performance	2	Hydraulic	2
6	WTW Water Quality Compliance	0	-	0
7	Flooding due to Hydraulic Overload	1	Hydraulic	2
8	WTW Dry Weather Flow Compliance	0	-	0
9	Good Ecological Status / Good Ecological Potential	0	-	
10	Surface Water Management	2	Hydraulic	
11	Nutrient Neutrality	NA	-	NA
12	Groundwater Pollution	2	Operational	
13	Bathing Waters	1	Unknown	
14	Shellfish Waters	NA	-	

Key

BRAVA Risk Band	
NA	Not Applicable*
0	Not Significant
1	Moderately Significant
2	Very Significant

*No issues relevant to planning objective within Wastewater System

Investment Strategy

The risks identified in this wastewater system mean that we have assigned the following investment strategy:

Improve

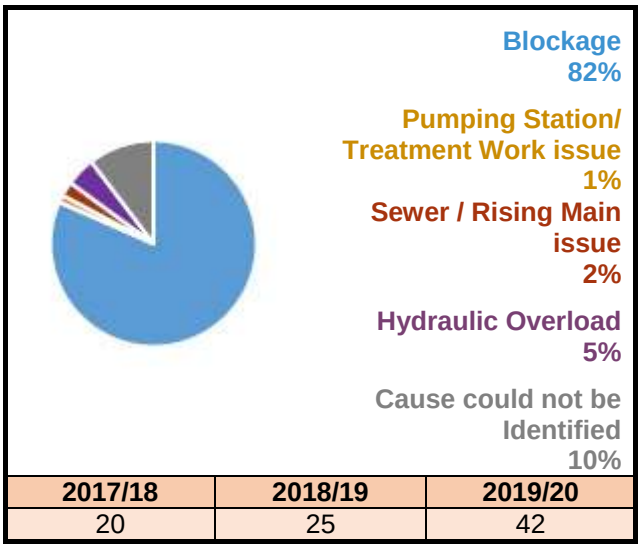
This means that we consider that the current performance of the drainage and wastewater system needs to be improved to reduce the impacts on our customers and/or the environment. We will plan investment to reduce the current risks by actively looking to invest capital funding in the short term to address current performance issues (and consider future risks when implementing improvements).

Planning Objective 1: Internal Sewer Flooding Risk

The number of internal sewer flooding incidents reported during the three years considered by the risk assessment are shown in Figure 1. The total number of connections in this wastewater system means there have been between 1.68 and 3.35 incidents per 10,000 connections per year (a threshold set by Ofwat) so the risk is in the 'moderately significant' band.

The primary driver for internal sewer flooding in this wastewater system is 'Customer'. Blockages caused 82% of all incidents recorded in this wastewater system. Blockages are often caused by fats, oils, grease, nappies, wet wipes and sanitary products within the system. These items are non-flushable and should not be disposed of into wastewater systems.

Figure 1: Number of internal flooding incidents per annum and causes



2017/18	2018/19	2019/20
20	25	42

Planning Objective 2: Pollution Risk

There has been less than one pollution incident reported on average during the three year period considered by the risk assessment, so the risk is in the 'not significant' band. The exception is if there were two incidents in the most recent year.

Planning Objective 3: Sewer Collapse Risk

The number of sewer collapses reported during the three years considered by the risk assessment are shown in Table 2. The length of sewer in this wastewater system means there have been less than 5.72 incidents per 1,000km per year (a threshold set by Ofwat) so the risk is in the 'not significant' band.

Table 2: Sewer collapses and rising main bursts

Sewer Collapse	**2017/18**	6
	2018/19	4
	2019/20	10
Rising Main Bursts	**2017/18**	1
	2018/19	0
	2019/20	0

Planning Objective 4: Sewer Flooding in a 1 in 50 Year Storm

The risk of flooding in a 1 in 50 year storm is very significant in 2020 and 2050. This is because our computer model of the sewer network indicate for 2020 that approximately 9600 - 9700 properties within this wastewater system are in areas that could flood by water escaping from sewers. This model prediction increases the number of properties in areas at risk from flooding to approximately 9800 - 9900 by 2050.

Our wastewater networks are generally designed with capacity for up to a 1 in 30 year storm, hence flooding is expected to occur during more severe storms such as a 1 in 50 year event. Flooding will occur due to insufficient capacity of the drainage system either on the surface before it enters the drainage system, and/or from manholes, in people's homes or at a low point elsewhere in the system.

Planning Objective 5: Storm Overflow Performance

The storm overflow performance risk has been assessed as very significant for both 2020 and 2050. Table 3 shows the overflows that discharge above the low threshold set for storm overflow discharges to Shellfish Water, Bathing Water and inland rivers.

The primary driver for the Storm Overflow Performance is 'Hydraulic.'

Table 3: Overflows exceeding discharge frequency threshold per annum

	Number of overflows		Threshold for number of discharges per annum		
	2020	2050	Low	Medium	High
Shellfish Waters	0 Medium	0 Medium	Less than 8	Between 8-10	10 or more
Bathing Waters	1 High	1 Medium	Less than 3	Between 3-10	10 or more
Freshwater	1 High	1 High	Less than 20	Between 20-40	40 or more

Planning Objective 6: Wastewater Treatment Works Water Quality Compliance

The risk of non-compliance with our wastewater quality permit has been assessed as not significant for both 2020 and 2050. This is because the wastewater treatment works has no record of compliance failure during the last three years (2018-2020).

Planning Objective 7: Flooding due to Hydraulic Overload

This is an assessment of the risk of flooding from sewers during a 1 in 30 year storm, and more frequent rainfall, to understand where flooding could occur. The risk of sewer flooding due to hydraulic overload is moderately significant in 2020. The risk The annualised number of properties in areas at risk of flooding is shown in Table 4.

Table 4: Annualised number of properties at risk per 10,000 connections.

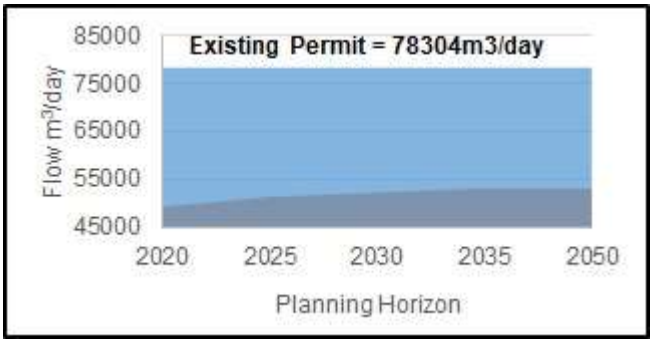
Rainfall Return Period (yr)	Number of Properties at Risk		Annualised per 10,000 connections	
	2020	2050	2020	2050
1 in 1	406	741	257	468
1 in 2	578	1321	227	520
1 in 5	2043	2869	370	520
1 in 10	3564	6808	339	648
1 in 20	5959	10475	291	511
1 in 30	7383	12713	242	417
Total Annualised			**1726**	**3084**

This indicates that the existing capacity of the wastewater network can be exceeded during 1 in 30 year storms (or more frequent events), and that the risk will increase due to future growth, creep and/or climate change by 2050.

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow (DWF) Compliance is not significant for both 2020 and 2050. This is because the average annual DWF for 2017, 2018 and 2019 has been below 80% of the current permit. The predicted DWF in 2050 is also expected to remain below 80% of the current permit, shown in Figure 2.

Figure 3: Recorded and predicted dry weather flow with existing permit



Planning Objective 9: Good Ecological Status / Good Ecological Potential

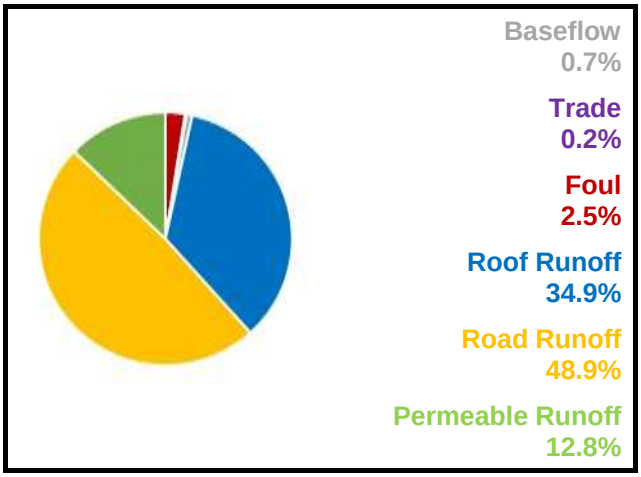
This wastewater system is not hydraulically linked to a waterbody where wastewater operations are contributing to not achieving GES/GEP, therefore the risk is not significant.

Planning Objective 10: Surface Water Management

Our initial high level assessment indicated that there is very significant interaction between surface water flooding and flooding from sewers in this wastewater system.The cause of this localised flooding is the capacity of the drainage network in these areas to convey both wastewater and surface water run-off.

Figure 3 illustrates the sources of water flowing in the wastewater system during a 1 in 20 year storm. It shows that surface water runoff from roofs, road and permeable surfaces constitutes more than 96.6% of the flow in the sewers. The total contribution of foul water from homes is 2.5% with business contributing 0.2%. The baseflow is infiltration from water in the ground and makes up 0.7% of the flow in the system.

Figure 3: Sources of water flowing in sewers during a 1 in 20 year storm



Planning Objective 11: Nutrient Neutrality

This wastewater system is not hydraulically linked to Habitat Sites noted as under threat by Natural England.

Planning Objective 12: Groundwater Pollution

The risk of Groundwater Pollution is very significant. The wastewater system network of sewers extends across geographical areas that are designated as a Source Protection Zone (SPZ) for water supply. Sewer survey data indicates that parts of the sewer network are in poor condition and are likely to leak sewage.

The primary driver is 'Operational' due to condition of our assets.

Planning Objective 13: Bathing Waters

The designated bathing waters that could be affected by discharges from this wastewater system are shown in Table 5, along with the current classification from the Environment Agency.

The risks from this wastewater system on Brighton Central bathing waters has led to an assessment of moderately significant.

Table 5: Bathing Water annual results

Bathing Waters	Annual Results		
	2017	2018	2019
Brighton Central	Good	Excellent	Excellent
Hove	Excellent	Excellent	Excellent
Brighton Kemptown	Excellent	Excellent	Excellent
Saltdean	Good	Excellent	Excellent
Southwick	Excellent	Excellent	Excellent

This planning objective requires further investigations to better understand the causes of risks and the drivers.

Planning Objective 14: Shellfish Waters

The discharges from this wastewater system do not impact on any designated shellfish waters.

Southern Water
August 2021
Version 1

Generic Options Assessment for: Peacehaven Brighton (BRIG)

Planning Objectives		2020	Driver	2050
PO1	Internal Flooding	1	Customer	-
PO2	Pollution Risk	0	-	-
PO3	Sewer Collapse	0	-	-
PO4	Risk of Sewer Flooding in 1 in 50 yr	2	Hydraulic	2
PO5	Storm Overflow Performance	2	Hydraulic	2
PO6	Risk of WTW Compliance Failure	0	-	0
PO7	Annualised Flood Risk/Hydraulic Overload	1	Hydraulic	2
PO8	DWF Compliance	0	-	0
PO9	Achieve Good Ecological Status	0	-	-
PO10	Improve Surface Water Management	2	Hydraulic	-
PO11	Secure Nutrient Neutrality	NA	-	NA
PO12	Reduce Groundwater Pollution	2	Operational	-
PO13	Improve Bathing Water Quality	1	Unknown	-
PO14	Improve Shellfish Water Quality	NA	-	-

Type of Measures	Generic Option Categories	Icon	Take Forward?	Reasons	Examples of Generic Options
Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off		Y	-	Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management
	Reduce groundwater levels		N	None of the significant risks in this catchment are caused by high groundwater levels. Hence reducing groundwater levels will not impact any of the risks in this catchment.	Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
	Improve **quality** of wastewater		Y	-	Domestic and business customer education; incentives and behaviour change (reduce Fats, Oils & Grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment
	Reduce the **quantity** / demand		N	None of the significant risks are caused by too much foul wastewater entering our systems from homes and businesses.	Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
Pathway (Supply) Measures (to reduce likelihood)	Network Improvements		Y	-	Asset optimisation; additional network capacity; storage; separate flows; structural repairs; re-line sewer pipe and manholes; smart networks.
	Improve Treatment Quality		N	There are no causes of risk due to the wastewater recycling processes. Hence, improving the quality of wastewater treatment will not reduce the significant risks in this wastewater catchment.	Increase treatment capacity; rationalisation of treatment works (centralisation / de-centralisation); install tertiary plant; UV plant or disinfection facilities; innovation; improve Technical Achievable Limits; new WTWs
	Wastewater Transfer to treatment elsewhere		N	The causes of risk are not due to where our systems discharge to the environment or our ability to increase the capacity to connect more homes. Transferring wastewater for treatment elsewhere will not reduce any of the significant risks in this catchment.	Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality		N/A	Not included in first round of DWMPs	Carbon offsetting; noise suppression /filtering; odour control and treatments
	Improve Land and Soils		N/A	Not included in first round of DWMPs	Sludge soil enhancement
	Mitigate impacts on receiving waters		N	The receiving waters are not advserly impacted by our wastewater operations. Hence, offsetting any adverse impacts on receiving waters will not reduce any of the significant risks in this catchment.	River enhancement, aeration
	Reduce impact on properties		Y	-	Property flood resilience; non-return valves; flood guards / doors; air brick covers
Other	Study / Investigation		Y	-	Additional data required; hydraulic model development; WQ monitoring and modelling

August 2021
Version 1

Peacehaven Brighton Wastewater System - Outline Options Appraisal

Generic Option	Location of Risk	Planning Objective and Description of Risk	Option Reference	Description	Further Description	Unconstrained Option?	Constrained Option?	Feasible Option?	Net Benefits	Estimated Cost	Preferred Option	Best value / Least cost or Reasons for Rejection
Control/ Reduce surface water entering the sewers	BRIG FC01_1 - Middle Road,	PO4 and PO7 Flooding	BRIG.SC01.1	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC02_1 - The Ridgeway,	PO4 and PO7 Flooding	BRIG.SC01.2	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC03_1 - Tongdean Lane,	PO4 and PO7 Flooding	BRIG.SC01.3	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC04_1 - South Coast Road,	PO4 and PO7 Flooding	BRIG.SC01.4	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC05_1 - Preston / New England Rd,	PO4 and PO7 Flooding	BRIG.SC01.5	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC06_1 - Wilbury Crescent,	PO4 and PO7 Flooding	BRIG.SC01.6	Surface Water Separation	DAP Option.	No						
Control/ Reduce surface water entering the sewers	BRIG FC07_1 - Warmdene Road,	PO4 and PO7 Flooding	BRIG.SC01.7	Surface Water Separation	DAP Option.	No						
Control / Reduce groundwater infiltration												
Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste)	Catchment Wide	PO1- Internal Flooding	BRIG.SC03.1	Customer Education Programme	Customer education programme to reduce the risk.	Yes	Yes	Yes	Minor Positive +	£115K	Yes	Best Value
Control / Reduce the quantity / flow of wastewater entering sewer system												
Network Improvements (eg increase capacity, storage, conveyance)	MARINE DRIVE BRIGHTON WPS	PO1- Internal Flooding	BRIG.PW01.1	Maintenance Programme	An efficient maintenance programme for pumping stations and/Treatment works.	No						Risk and uncertainty - future resilience
Network Improvements (eg increase capacity, storage, conveyance)	Hotspot 1 - Preston Park Hotspot 2 - The Lanes Hotspot 3 - Peacehaven	PO1- Internal Flooding	BRIG.PW01.2	Additional Storage	Additional Storage.	No						Do customer support it
Network Improvements (eg increase capacity, storage, conveyance)	Catchment Wide	PO1- Internal Flooding	BRIG.PW01.3	Pipe Rehabilitation Programme	Pipe Rehabilitation Programme.	No						Risk and uncertainty - future resilience
Network Improvements (eg increase capacity, storage, conveyance)	Falmer- Goldstone (Priority Catchment)- Lewes Road (Priority Catchment)- Patcham- Surrenden (Priority Catchment)- Balsdean- Housedean- Newmarket (B,C and D)-	PO12- Ground Water Pollution	BRIG.PW01.4	Pipe Rehabilitation Programme	Total length of sewer within protection zones- 0km.	Yes	Yes	Yes	Minor Positive +	£10,400K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Catchment Wide	PO1- Internal Flooding	BRIG.PW01.5	Jetting Programme	Jetting Programme.	Yes	Yes	Yes	Minor Positive +	£810K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC01_1 - Middle Road,	PO4 and PO7 Flooding	BRIG.PW01.6	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£5,930K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC02_1 - The Ridgeway,	PO4 and PO7 Flooding	BRIG.PW01.7	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£6,735K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC03_1 - Tongdean Lane,	PO4 and PO7 Flooding	BRIG.PW01.8	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£3,310K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC04_1 - South Coast Road,	PO4 and PO7 Flooding	BRIG.PW01.9	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,280K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC05_1 - Preston / New England Rd,	PO4 and PO7 Flooding	BRIG.PW01.10	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,250K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC06_1 - Wilbury Crescent,	PO4 and PO7 Flooding	BRIG.PW01.11	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£735K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC07_1 - Warmdene Road,	PO4 and PO7 Flooding	BRIG.PW01.12	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£8,755K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC01 Clarendon Villas	PO4, PO7 and PO1 - Flooding	BRIG.PW01.13	Upsizing and Online Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	No	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC02 Clarendon Villas	PO4, PO7 and PO1 - Flooding	BRIG.PW01.14	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,470K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC03 Godwin Road	PO4, PO7 and PO1 - Flooding	BRIG.PW01.15	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	No	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC04 Godwin Road	PO4, PO7 and PO1 - Flooding	BRIG.PW01.16	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£450K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC05 Millyard Crescent	PO4, PO7 and PO1 - Flooding	BRIG.PW01.17	Upsizing and Online Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,295K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC06 Millyard Crescent	PO4, PO7 and PO1 - Flooding	BRIG.PW01.18	Upsizing and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC07 Ovingdean Road	PO4 and PO7 - Flooding	BRIG.PW01.19	Upsizing and Online Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£TBC - With Partners	No	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC07 Ovingdean Road	PO4 and PO7 - Flooding	BRIG.PW01.20	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£985K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC08 Stanmer Villas	PO4, PO7 and PO1 - Flooding	BRIG.PW01.21	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£1,840K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC09 Stanmer Villas	PO4, PO7 and PO1 - Flooding	BRIG.PW01.22	Upsizing and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC011 Woodland Drive	PO4, PO7 and PO1 - Flooding	BRIG.PW01.23	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£165K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC012 Woodland Drive	PO4, PO7 and PO1 - Flooding	BRIG.PW01.24	Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC013 Montreal Close	PO4, PO7 and PO1 - Flooding	BRIG.PW01.25	New sewers and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£475K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC014 Tongdean Lane/Valley Drive	PO4, PO7 and PO1 - Flooding	BRIG.PW01.26	Upsizing, Online and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC015 Tongdean Lane/Valley Drive	PO4, PO7 and PO1 - Flooding	BRIG.PW01.27	Upsizing, Online and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC016 Willbury Crescent	PO4, PO7 and PO1 - Flooding	BRIG.PW01.28	Upsizing, Online Storage and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC017 Willbury Crescent	PO4, PO7 and PO1 - Flooding	BRIG.PW01.29	Upsizing and Offline Storage	DAP Option.	No						
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC018 Preston Road	PO4, PO7 and PO1 - Flooding	BRIG.PW01.30	Upsizing and Offline Storage	DAP Option.	No						

Peacehaven Brighton Wastewater System - Outline Options Appraisal

Generic Option	Location of Risk	Planning Objective and Description of Risk	Option Reference	Description	Further Description	Unconstrained Option?	Constrained Option?	Feasible Option?	Net Benefits	Estimated Cost	Preferred Option	Best value / Least cost or Reasons for Rejection
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC019 Clarendon Villas	PO4 and PO7 - Growth	BRIG.PW01.31	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC020 Woodland Drive	PO4 and PO7 - Growth	BRIG.PW01.32	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC021 Preston Road	PO4 and PO7 - Growth	BRIG.PW01.33	Upsizing and 2 new storages	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC022 Brighton	PO4 and PO7 - Growth	BRIG.PW01.34	Upsizing, Relay and 2 new Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC023 Brighton	PO4 and PO7 - Growth	BRIG.PW01.35	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC024 Brighton	PO4 and PO7 - Growth	BRIG.PW01.36	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC025 Millyard Crescent and Ovingdean Road	PO4 and PO7 - Growth	BRIG.PW01.37	Upsizing and Offline Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC026 Montreal Close	PO4 and PO7 - Growth	BRIG.PW01.38	Upsizing	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	BRIG FC027 Brighton Marina CEO	PO4, PO7 and PO5 - Growth	BRIG.PW01.39	Storage	DAP Option.	Yes	Yes	Yes	Major Positive +++	£2,385K	Yes	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)												
Wastewater Transfer												
Mitigate impacts on Air Quality (e.g. Carbon neutrality, noise, odour)												Not included in the first round of DWMPs
Improve Land and Soils												Not included in the first round of DWMPs
Mitigate impacts on Water Quality												
Reduce consequences Properties (e.g. Property Flood Resilience)	Hotspot 1 - Preston Park Hotspot 2 - The Lanes Hotspot 3 - Peacehaven	PO1- Internal Flooding	BRIG.RC04.1	Property Flood Mitigation / Resistance	Short-term property level protection ahead of flood alleviation scheme.	No						Risk and uncertainty - future resilience
Study/ investigation to gather more data	Hotspot 4 - Hove Hotspot 5 - Brighton City Centre Hotspot 6 - Kemp Town Hotspot 7 - Preston Park Hotspot 8 - Hanover	PO1- Internal Flooding	BRIG.OT01.1	Investigation into causes	Further investigation to identify the cause of the internal flooding incident.	No						Cost Effective
Study/ investigation to gather more data	Falmer- Goldstone (Priority Catchment)- Lewes Road (Priority Catchment)- Patcham- Surrenden (Priority Catchment)- Balsdean- Housedean- Newmarket (B,C and D)-	PO12- Ground Water Pollution	BRIG.OT01.2	Study and Investigations	Total length of sewer within protection zones- 421.	No						Cost Effective
Study/ investigation to gather more data	MARINE DRIVE BRIGHTON WPS	PO5 Storm Overflow	BRIG.OT01.3	Storage	Storage.	Yes	Yes	Yes	Minor Positive +	£1,000K	Yes	Best Value
Study/ investigation to gather more data	Catchment Wide	PO4- 1 in 50 year PO5- Storm Overflow PO7- Hydraulic Overload PO10- Surface Water Management	BRIG.OT01.4	Improve Hydraulic Model	Improve Hydraulic Model.	Yes	Yes	Yes	Minor Positive +	£800K	Yes	Best Value

DWMP Investment Needs

1. The options listed in the DWMP Investment Needs below are the preferred options in our DWMP. They will need further refinement as we implement the DWMP to confirm the exact location and scope of action needed, and the cost.

2. The costs are indicative costs for planning purposes only. The basis for the cost estimates, including assumptions and uncertainties, are explained in our DWMP Investment Plans.

3. The table of Investment Need provides an indicative cost so we know what level of funding is needed to reduce the risks. It is not a commitment to fund or deliver any option.

4. The Indicative Timescale is when the investment is needed. Some options may take several investment periods to achieve the desired outcomes.

5. Potential Partners have been identified in the table of Investment Needs. This is to indicate where there may be opportunities for us to work with these partners when developing and delivering these options. It is not a commitment by any of the partners to work with us.

6. These options will inform our future business plans as part of the Ofwat periodic review process to secure the finance to implement these options.

7. The options listed are prioritised by the method stated in the Programme Appraisal Technical Summary.

Date : May 2023
Version : 1.0

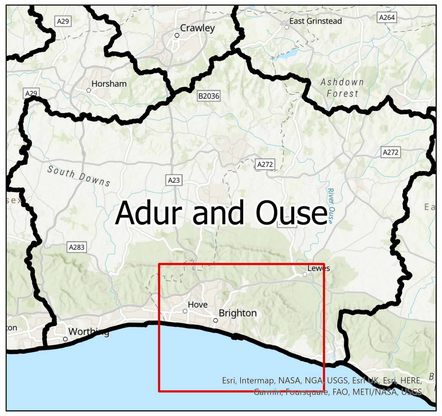
Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
Adur and Ouse								
Peacehaven Brighton								
BRIG.SC03.1	Adur and Ouse	Peacehaven Brighton	The Lanes North Laine Church Road	Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network	£115K	AMP8 onwards	East Sussex County Council Brighton City Council	PO1
BRIG.PW01.4	Adur and Ouse	Peacehaven Brighton	Goldstone, Lewes Road, Patcham, Balsdean, Housedean	Sewer Rehabilitation: Targeted CCTV or electroscan surveys to check the integrity of sewers and reline or renew them to reduce the risk of groundwater pollution	£10,400K	AMP9 to AMP10	-	PO12
BRIG.PW01.5	Adur and Ouse	Peacehaven Brighton	The Lanes North Laine Church Road	Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network	£810K	AMP8 onwards	-	PO1
BRIG.PW01.6	Adur and Ouse	Peacehaven Brighton	Middle Road	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£5,930K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.7	Adur and Ouse	Peacehaven Brighton	The Ridgeway	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£6,735K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.8	Adur and Ouse	Peacehaven Brighton	Tongdean Lane	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£3,310K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.9	Adur and Ouse	Peacehaven Brighton	South Coast Road	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£2,280K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.10	Adur and Ouse	Peacehaven Brighton	Preston / New England Rd	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£1,250K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.11	Adur and Ouse	Peacehaven Brighton	Wilbury Crescent	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£735K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.12	Adur and Ouse	Peacehaven Brighton	Warmdene Road	Growth scheme from our Drainage Area Plan (DAP): Attenuate excess flows in sewer network using storage tanks to reduce risk of flooding. Option priced based on storage tanks but surface water separation is the preferred approach.	£8,755K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.14	Adur and Ouse	Peacehaven Brighton	Clarendon Villas	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£1,470K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.16	Adur and Ouse	Peacehaven Brighton	Godwin Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£450K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.17	Adur and Ouse	Peacehaven Brighton	Millyard Crescent	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£1,295K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.20	Adur and Ouse	Peacehaven Brighton	Ovingdean Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£985K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7

Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
BRIG.PW01.21	Adur and Ouse	Peacehaven Brighton	Stanmer Villas	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£1,840K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.23	Adur and Ouse	Peacehaven Brighton	Woodland Drive	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£165K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.25	Adur and Ouse	Peacehaven Brighton	Montreal Close	Growth scheme from our Drainage Area Plan (DAP): New sewers and storage tanks to accommodate flows from future development	£475K	AMP9	East Sussex County Council Brighton City Council	PO1 PO4 PO7
BRIG.PW01.31	Adur and Ouse	Peacehaven Brighton	Clarendon Villas	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.32	Adur and Ouse	Peacehaven Brighton	Woodland Drive	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.33	Adur and Ouse	Peacehaven Brighton	Preston Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.34	Adur and Ouse	Peacehaven Brighton	Preston Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.35	Adur and Ouse	Peacehaven Brighton	Preston Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers in Preston Road to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.36	Adur and Ouse	Peacehaven Brighton	Preston Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.37	Adur and Ouse	Peacehaven Brighton	Millyard Crescent and Ovingdean Road	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers and storage tanks to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.PW01.38	Adur and Ouse	Peacehaven Brighton	Montreal Close	Growth scheme from our Drainage Area Plan (DAP): Upsize sections of local sewers in Montreal Close to accommodate flows from future development	£2,385K	AMP9	East Sussex County Council Brighton City Council	PO4 PO7
BRIG.OT01.4	Adur and Ouse	Peacehaven Brighton	System Wide	Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy	£800K	AMP8	-	PO4 PO5 PO7 PO10
BRIG.CONS01.1	Adur and Ouse	Peacehaven Brighton	System Wide	Reduce the number of storm discharges from Portobello Brighton Overflow	£TBC	AMP8	-	PO2
BRIG.WINEP01.1	Adur and Ouse	Peacehaven Brighton	MARINE DRIVE BRIGHTON NO.2 CEO	Reduce the number of storm discharges from MARINE DRIVE BRIGHTON NO.2 CEO by a combination of SuDS and storage options	£135,575K	AMP9	-	PO4 PO5 PO7 PO13
BRIG.WINEP01.2	Adur and Ouse	Peacehaven Brighton	BLACK ROCK BRIGHTON CEO	New or improved screen to reduce aesthetics impacts from storm discharges at BLACK ROCK BRIGHTON CEO	£130K	AMP12	-	PO5

Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
BRIG.WINEP01.3	Adur and Ouse	Peacehaven Brighton	ALBION GROYNE BRIGHTON CEO	New or improved screen to reduce aesthetics impacts from storm discharges at ALBION GROYNE BRIGHTON CEO	£130K	AMP12	-	PO5

Drainage and Wastewater Management Plan: Location of Potential Options PEACEHAVEN BRIGHTON Wastewater system in Adur and Ouse River Basin Catchment

(i) This map should be read in conjunction with the list of Investment Needs for this wastewater system
(ii) The areas shown on this map are the potential locations for the options. The location of the risk may be elsewhere in the system.
(iii) Labels for each location are the option references in the list of Investment Needs
(iv) Drainage Area Plan (DAP) options on flooding and growth are not shown.



- Customer Education
- Pipe Rehabilitation
- Asset Resilience
- Wastewater Treatment
- WINEP Nutient Neutrality
- WINEP Storm Overflows